WE CLAIM:

1. An arrangement for generating hydrogen gas comprising:

(a) a catalyst chamber comprising a catalyst,

(b) a fuel chamber comprising a reactant material capable of generating hydrogen gas when contacting said catalyst,

(c) a spent fuel chamber connected to the catalyst chamber for receiving said reactant material after contacting said catalyst and for receiving hydrogen gas generated by contacting the reactant material and the catalyst,

(d) a conduit between the spent fuel chamber and fuel chamber, the conduit including a check valve, and

(e) an outlet conduit connected to the check valve.

2. Arrangement according to claim 1 wherein the outlet conduit includes a pressure relief valve.

3. Arrangement according to claim 1 wherein the fuel chamber comprises a bladder.

4. Arrangement according to claim 1 wherein the fuel chamber comprises a piston.

5. Arrangement according to claim 1 further comprising a pump located in between the fuel chamber and catalyst chamber.

6. Arrangement according to claim 1 wherein the fuel chamber comprises a fuel sensor and further comprising a main fuel tank connected to a fuel pump having an outlet connected to the fuel chamber.

7. Arrangement according to claim 6 further comprising a main spent fuel tank adjacent to the main fuel tank wherein the main spent fuel tank is connected to the spent fuel chamber.

8. Arrangement according to claim 1 further comprising a volume exchange tank having a fuel area portion, a spent fuel area portion and a movable partition therebetween, wherein the fuel area portion includes an outlet line connected to the fuel chamber and an inlet line connected to the spent fuel chamber.

9. Arrangement according to claim 1 further comprising a volume exchange tank having a fuel area portion and a spent fuel area portion wherein at least of one selected from the group consisting of the fuel area portion and spent fuel area portion is a flexible bladder.

10. Arrangement according to claim 1 further comprising a plurality of tanks connected to the fuel chamber and spent fuel chamber.

11. Arrangement according to claim 10 wherein the plurality of tanks are arranged in a parallel configuration.

12. A method of generating hydrogen gas comprising:

providing an arrangement for generating hydrogen gas comprising a catalyst chamber comprising a catalyst, a fuel chamber comprising a reactant material capable of generating

hydrogen gas when contacting said catalyst, a spent fuel chamber connected to the catalyst chamber for receiving said reactant material after contacting said catalyst and for receiving hydrogen gas generated by contacting the reactant material and the catalyst, a conduit between the spent fuel chamber and fuel chamber, the conduit including a check valve, and an outlet conduit connected to the check valve,

applying pressure to the fuel chamber wherein reactant material is conveyed to the catalyst chamber, and

contacting the catalyst with the reactant material thereby generating hydrogen gas.

13. A method according to claim 4 wherein the hydrogen gas is generated without the use of a pump connected to an electrical power source.

14. A method according to claim 4 wherein the hydrogen gas is generated without the use of externally supplied electrical power.

15. A method according to claim 12 wherein the fuel chamber comprises a piston and wherein applying pressure to the fuel chamber causes movement of the piston through the fuel chamber wherein reactant material is conveyed out of the fuel chamber to the catalyst chamber.

16. A method according to claim 12 wherein the fuel chamber comprises a bladder and wherein applying pressure to the fuel chamber causes flexing of the bladder wherein reactant material is conveyed out of the fuel chamber to the catalyst chamber.

17. A method according to claim 12 comprising providing a fuel pump in between the fuel chamber and the catalyst chamber and conveying fuel from the fuel chamber to the catalyst chamber at an environmental pressure P_F - P_B where P_F is the gas pressure in the fuel chamber and P_B is the gas pressure in the spent fuel chamber.

18. A method according to claim 12 further comprising:

providing a main fuel tank adjacent to a spent fuel tank connected to a fuel pump having an outlet line connected to the fuel chamber and a fuel sensor located in the fuel chamber,

sensing the amount of fuel in the fuel chamber with the sensor, and determining whether the fuel level is low or adequate,

upon determining the fuel level is low activating the fuel pump and pumping fuel from the main fuel tank into the fuel chamber; and

upon determining the fuel level is adequate deactivating the fuel pump.

19. A method according to claim 18 further comprising

providing a spent fuel sensor in the spent fuel chamber and a spent fuel valve which allows spent fuel to drain from the spent fuel chamber into the spent fuel tank;

sensing the amount of spent fuel in the spent fuel chamber with the spent fuel sensor and determining whether the spent fuel level is low; and

upon determining the spent fuel level is low closing the spent fuel valve.

20. A method according to claim 12 further comprising:

providing a volume exchange tank having a fuel area portion and a spent fuel area portion wherein the fuel area portion includes an outlet line connected to the fuel chamber and the spent fuel area portion includes an inlet line connected to the spent fuel chamber, and a movable partition in between the fuel area portion and spent fuel area portion;

conveying fuel through the outlet line from the fuel area portion to the fuel chamber,

moving the movable partition towards the fuel area portion; and

receiving spent fuel into the spent fuel area portion through the inlet line from the spent fuel chamber.

21. A method according to claim 12 further comprising:

providing volume exchange tank having a fuel area portion and a spent fuel area portion, the fuel area portion contained in a flexible bladder having an outlet line connected to the fuel chamber, the spent fuel area portion located outside the flexible bladder and including an inlet line connected to the spent fuel chamber;

conveying fuel through the outlet line from the fuel area portion to the fuel chamber, wherein the flexible bladder shrinks in volume; and

receiving spent fuel into the spent fuel area from the spent fuel chamber through the inlet line.

22. A method according to claim 12 further comprising:

providing a volume exchange tank having a fuel area portion having an outlet line connected to the fuel chamber and spent fuel area portion, the spent fuel area portion contained within a flexible bladder and having an inlet line connected to the spent fuel chamber;

receiving spent fuel from the spent fuel chamber into the spent fuel area portion through the inlet line thereby expanding the flexible bladder; and

conveying fuel through the outlet line from the fuel area portion to the fuel chamber.

23. A method according to claim 12 further comprising:

providing a volume exchange tank having a fuel area portion contained within a first flexible bladder having an outlet line connected to the fuel chamber and a spent fuel area portion contained within a second flexible bladder having an inlet line connected to the spent fuel chamber;

receiving spent fuel from the spent fuel chamber into the second flexible bladder through the inlet line thereby expanding the flexible bladder; and

conveying fuel through the outlet line from the first flexible bladder to the fuel chamber thereby reducing the volume of the first flexible bladder.

24. A method according to claim 12 further comprising:

providing a plurality of tanks connected to the fuel chamber and spent fuel chamber;

conveying fuel from at least one of the plurality of tanks to the fuel chamber; and

conveying spent fuel to at least one empty tank from the spent fuel chamber.